



Geoscience and Environment Center

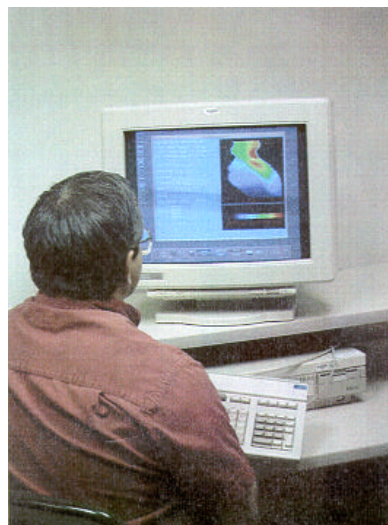
The Geoscience and Environment Center provides a broad and integrated set of capabilities that are focused on improved understanding of the subsurface and on development of technology for specific applications. Present activities include basic research, applied research, and technology development for: remediation of sites having contaminated soils and groundwater; disposal of radioactive waste in underground repositories; storage of strategic reserves of petroleum and other hydrocarbons in man-made caverns; recovery of oil and gas from geologic reservoirs; and support of defense-related activities. A major responsibility of the Center is to carry out the remediation of Sandia's contaminated sites under the provisions of RCRA.

In a programmatic sense, we are responsible for initiating and managing all of Sandia's work dealing with the environment and serve as the principal contact with that industry. In addition, we are responsible for initiating and managing projects with oil and gas exploration and production firms. Finally, we serve as the principal Sandia contact for geoscience research sponsored by DOE's Office of Energy Research.

The Center is staffed by more than 100 technical employees, supported by a blend of administrative personnel. We have an active program for post-doctoral fellows, students, and visiting industry associates. Our permanent facilities are sited in Albuquerque, New Mexico, but we carry out field experiments wherever required.

Lines of Business

- Developing and applying methods for subsurface characterization to improve understanding of:
 - Soil and rock-mass structure and properties;
 - Fluid flow and fluid rock interactions in geologic media;
 - Contaminants fate and migration.Two particular emphases are borehole instrumentation, and numerical methods for characterizing the subsurface.
- Developing and applying methods for analysis and improvement of in situ processes, related to:
 - Subsurface barriers;
 - Removal or stabilization of hazardous species in soil, rock, or groundwater;
 - Leaching of underground caverns in salt;
 - Stabilization of underground facilities such as mines, waste repositories, and storage caverns;
 - Reservoir stimulation, production, and management.

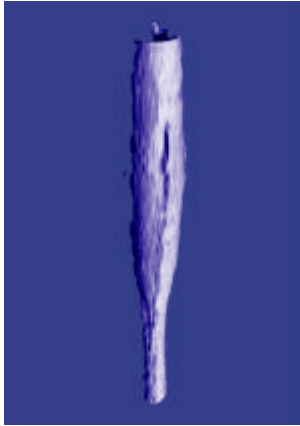


*Developing regional flow model
within the Delaware Basin*

Sandia National Laboratories • Geoscience & Environment Center

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*Processed Acoustic Image of a
Leached Storage Cavern*



*Sandia in situ permeable flow
sensor being installed*

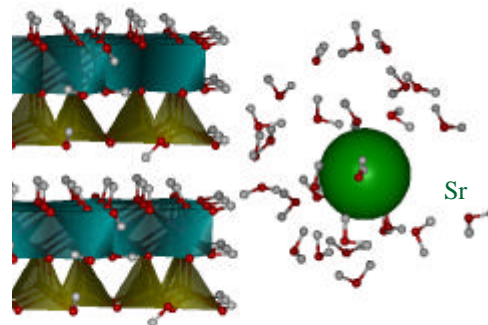
- Remediation of contaminated sites at Sandia under the provisions of RCRA.
- Basic and Exploratory Geoscience research that directs and enhances our subsurface characterization and in situ process improvement lines of business. This research encompasses:
 - Geochemistry
 - Geohydrology
 - Geomechanics
 - Geophysics



Alternative Leached Storage Cavern Demonstration



*First Phase of EPA-Approved Corrective
Action Management Unit (CAMU)*



*Simulation of Metal Sorption in Kaolinite
Clay (010 View)*

Capabilities and Facilities

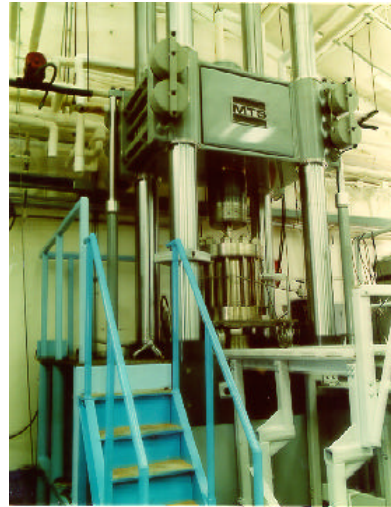
We have a number of strong capabilities and facilities used in conjunction with strengths of other Sandia centers and non-Sandia partners to meet programmatic goals. Significant capabilities and facilities include:

- Laboratory and large-scale field testing
- Instrumentation development
- Code development and modeling
- Ability to manage major projects
- RCRA Site Remediation Management

- Rock mechanics lab
- Flow visualization lab
- Molecular modeling lab



Thermo-Mechanical Drift at Yucca Mountain



Load frame and pressure vessel

